

# **NAVAL POSTGRADUATE SCHOOL**

## **Monterey, California**



## **THESIS**

**The Influence of Varsity Athletics on Midshipman  
Performance**

by

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June 2003

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**Distribution Statement**

<b>REPORT DOCUMENTATION PAGE</b>		<i>Form Approved OMB No. 0704-0188</i>	
Public reporting burden for this collection of information is estimated to average 1 hour per response, including the time for reviewing instruction, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington, VA 22202-4302, and to the Office of Management and Budget, Paperwork Reduction Project (0704-0188) Washington DC 20503.			
<b>1. AGENCY USE ONLY (Leave blank)</b>	<b>2. REPORT DATE</b> 29 May 2002	<b>3. REPORT TYPE AND DATES COVERED</b> Master's Thesis, June 2002 – June 2003	
<b>4. TITLE AND SUBTITLE:</b> The Effects of Varsity Athletics on Midshipman Performance		<b>5. FUNDING NUMBERS</b>	
<b>6. AUTHOR(S)</b> M. Christopher Harvey		<b>8. PERFORMING ORGANIZATION REPORT NUMBER</b>	
<b>7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES)</b> Naval Postgraduate School Monterey, CA 93943-5000		<b>10. SPONSORING/MONITORING AGENCY REPORT NUMBER</b>	
<b>9. SPONSORING /MONITORING AGENCY NAME(S) AND ADDRESS(ES)</b> N/A			
<b>11. SUPPLEMENTARY NOTES</b> The views expressed in this thesis are those of the author and do not reflect the official policy or position of the Department of Defense or the U.S. Government.			
<b>12a. DISTRIBUTION / AVAILABILITY STATEMENT</b> Distribution Statement (mix case letters)		<b>12b. DISTRIBUTION CODE</b>	
<b>13. ABSTRACT (maximum 200 words)</b> <p>This study will examine the statistical effects of varsity athletics on Naval Academy Midshipman performance. Academic performance averages, military performance averages, conduct grade, and honor violation are analyzed with respect to Midshipmen participating in varsity athletics versus non-varsity athletics. Using hierarchical regression analysis, the expectation is that varsity athletes make up the upper-echelon of the Brigade of Midshipmen than non-varsity athletes. In the analysis however, no statistical significance is discovered with respect to varsity athletics, and that, consequently, varsity athletes perform to the same degree as non-varsity athletes. The results further outline the need for better prediction measures of Midshipman Performance.</p>			

<b>14. SUBJECT TERMS</b>			<b>15. NUMBER OF PAGES</b>
			<b>16. PRICE CODE</b>
<b>17. SECURITY CLASSIFICATION OF REPORT</b> Unclassified	<b>18. SECURITY CLASSIFICATION OF THIS PAGE</b> Unclassified	<b>19. SECURITY CLASSIFICATION OF ABSTRACT</b> Unclassified	<b>20. LIMITATION OF ABSTRACT</b> UL

NSN 7540-01-280-5500

Standard Form 298 (Rev. 2-89)  
Prescribed by ANSI Std. Z39-18

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## **ACKNOWLEDGMENTS**

I would like to thank Alice Crawford, Director, LEAD Program, Naval Postgraduate School for her open mind and ears to a new student. I would also like to thank my advisors Janice Laurence, and Armando Estrada, LEAD Program, Naval Postgraduate School, for their vast amounts of patience and accurate rudder orders in the completion of this thesis.

I would also like to say thanks for all of the love and support from my family, and the words of encouragement and belief from my friends and shipmates

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## I. INTRODUCTION

### A. BACKGROUND

The United States Naval Academy's purpose is to provide the Navy and Marine Corps with officers who are smart, honorable, and extremely fit for duty. The regimen of the Naval Academy seeks to continuously reinforce those principles through its practice and its mission:

To develop midshipmen morally, mentally, and physically and to imbue them with the highest ideals of duty, honor and loyalty in order to provide graduates who are dedicated to career of naval service and have potential for future development in mind and character to assume the highest responsibilities of command, citizenship, and government (Reef Points, U. S. Naval Academy, 2000, p. 7).

A large concentration of the Academy's effort is directed not only to character development and intellectual growth, but to physical growth as well. Just as the Naval Academy promotes the professional and intellectual development of midshipmen, so also must it fulfill its responsibility for each midshipman's physical development. This is met through a sports program that is one of the broadest in the nation (U. S. Naval Academy, 2000, Internet).

Physical development is ever-present in Midshipman life. The Academy hosts 29 varsity sports, 17 club sports, and 17 intramural sports year round. Every midshipman must participate in one of these sports during the year, regardless of club or extra-curricular activity association. It is important to note that the amount of time, participation, and intensity required is greater for midshipmen who participate in varsity athletics, than for those who participate in other clubs and intramural sports. For instance, an in-season varsity crew member will spend at least 20 hours per week in practice sessions; an intramural basketball player will only spend 5 to 6 hours per week playing their sport. Demanding physical education classes such as boxing, wrestling, and swimming are capped by even more demanding testing, such as a 10- meter dive and a 40-minute continuous swim.

The testing does not end there, however. Midshipmen, regardless of service choice, are required to take the Navy Physical Fitness Assessment (PFA) twice a year.

The minimum passing grade is set at the achievement of an "outstanding level" on normal Navy standards for the age group of 21 to 29 year olds. Failure to achieve such scores adds the secondary burden of attending remedial physical training in the morning, normally starting at 0530.

Varsity sports even have an indirect presence in Midshipmen life. The fourth-class Midshipmen are required to visit a sporting event on "the Yard" once a week. The entire Brigade is present for every home football game, as well as the Army-Navy football game, normally held outside of both Annapolis and West Point.

The percentage of midshipmen life that athletics occupies is extremely large. It is not without purpose, as stated earlier. What is unknown though is the effect of varsity athletics on Midshipmen performance. Viewpoints differ on the gains of varsity athletics in the undergraduate experience. Interscholastic athletic programs enhance student's intellectual and social development, and delineate the importance of success outside academia (Pressley, 1996). However, the addition of military requirements into an already hectic academic schedule leaves little time to sink elsewhere (Zettler, 2002). Does the strain of Midshipman athletics negatively affect the measures of a Midshipman's performance, specifically in academic quality point averages and military quality point averages? Are there increases in honor violations or decreases in conduct grades with varsity athletics? This thesis seeks to answer these questions using past data from three graduated classes.

## **B. OBJECTIVES**

The objective of this thesis is to explore the impact of varsity athletics on midshipman performance in terms of four measures: (1) academic quality point average, (2) military quality point average, (3) conduct grade, and (4) honor violations. The study will control for demographics and aptitude levels that could confound the results. In particular, the analytic strategy will control for race, ethnicity, gender, major, prior enlisted service, and SAT scores. Doing so will isolate the unique numeric relationship between varsity athletics and midshipman performance. Using multivariate regressions to attain control effects and then variable effects (varsity athletics) will make this possible.

Sports participation can be categorized by revenue varsity sport (football and basketball), non-revenue varsity sport (all other varsity sport teams), and non-varsity sport populations. However, for the present research a dichotomous measure—varsity sport participation versus all others—was all that was available. Due to the sample size and method, a categorized approach was not practical. Ideally, one might wish to assess whether revenue athletes (and which revenue athletes), who may sink excessive time into their respective sports, pay the penalty of achieving lower performance in academics and professional standards.

This study is intended to give faculty, administration, and staff of the Naval Academy and the Naval Academy Athletic Association a benchmark of the current progress of the varsity athletic program.

#### **C. SCOPE**

The scope of this research is limited to the classes of 1999 to 2001, with participation in varsity athletics noted by a "yes" or "no" for each case. The data from this thesis was compiled from the Naval Academy's Office of Institutional Research.

#### **D. ORGANIZATION**

This thesis is organized into five chapters. The next chapter reviews the literature regarding the effects of varsity athletics on various student programs in the United States, as well as current literature and instructions regarding Naval Academy Varsity Athletics. Chapter III discusses the model development and definition of specific measures, in addition to regression methodology and hypothesis testing. Chapter IV presents the data and data analysis, including interpretations of the data. Finally, Chapter V offers a research summary, administrative recommendations, and recommendations for further research.

## **II. LITERATURE REVIEW**

### **A. THE RISKS AND BENEFITS OF SPORTS PARTICIPATION**

Sports participation, in general, is associated with many benefits. In fact, much literature suggests that athletic participation and competition offer more than just health contributions. Goal setting, teamwork, and well-roundedness of individual character benefit from sports participation (Pate, 2001). The literature also suggests, however, that sports may distract or degrade from one's obligations or character. Obviously, a balance should be struck between one's everyday activities and interests.

The health benefits from sports participation are well-known. In general, research finds that athletes have better lifestyles and more health-driven habits than non-athletes (Pate, 2001). In particular, a recent study found the following:

...because sports participation typically involves substantial amounts of physical activity, the health benefits of regular exercise would be expected to accrue in young athletes. Because team rules and guidelines often promote health-enhancing behaviors, such as proper nutrition and avoidance of cigarette smoking, sports participation might promote health lifestyles via social pathways (Pate, 2001, p. 1).

Good health habits are enforced through multiple angles, such as teammates, coaches, and simply the rules of the game; in order to play well, one must continue such habits to improve performance (Pate, 2001). In general, sports participants are more apt to eat more healthily, less apt to use tobacco, drink alcohol, abuse illegal drugs, or engage in violent crimes (Pate, 2001).

Benefits of character also can be derived from sport (Hopton, 2002). Combative sports such as wrestling, judo, or boxing allow for several contributions. In a controlled setting, participants in these sports are taught the values of self-control and fair play, as well as honor and consideration of others (Hopton, 2002). Many other benefits are also derived from such sports:

...the challenge to test one's skill against another...to win or lose graciously...heightened physical and emotional awareness and the reciprocal sharing of acquired skills with an opponent...to conquer

fear...to withstand physical pain, to consider one's physical and emotional vulnerabilities and to continue to show proper respect (Hopton, 2002).

A degree of self-awareness, self-respect, and general discipline is promoted in combative sports; the escalation of violence and admitting defeat, both uneasy aspects of human behavior, are taught and reinforced by such participation (Hopton, 2002).

The risks associated with sports participation fall in the categories of injury and the "time sink." To speak solely on the sake of injury, millions of dollars from civilian and government institutions are spent on diagnosis and care (Swanson, 2000). In particular, the total cost encompassed over \$18 billion (Swanson, 2000). The number of emergency room patients during 1998, due to sports injuries alone, numbered 60 million (Swanson, 2000). These numbers continue to be on the rise for several reasons. First is the introduction of "extreme" and more physically risk-taking sports, such as freestyle bicycle, skateboarding, and the like (American Sports Data, 2003). Second, children are pushed to participate in sports at an earlier age. Research has shown reasons for this push from perceptions of inadequate school sports programs and increases in "pick-up" games such as football or basketball; less organization may lead to more injuries (American Sports Data, 2003).

The "time sink" is another consideration, especially at the Naval Academy. The book The Nightingale's Song relates the Academy experience through the eyes of three former Midshipmen, McFarlane, Webb, and North. In the early chapters of the book, the author relates the importance of "making a name" in the realm of varsity athletics: "I [McFarlane] did track in high school, but I was not fast. But I knew my basic coordination was superior and so I said, 'You've got to find a way to demonstrate some athletic excellence.' And I decided gym was it" (Timberg, 1995). Varsity athletics were almost a right of passage to become a real "Navy Man." This obsessiveness may detract from the overall experience of the Academy (Leskovich, 2002).

The positive effects of varsity athletics at the United States Naval Academy are well known, and the risks noted. The immediate effects of athletics are many. Athletes develop determination. Through practice and competing, they develop teamwork, a sense of group identity, sacrifice and self-discipline. All of these are indicative of good combat-leaders (Zettler, 2002).

## **B. PREVIOUS STUDIES ON STUDENT-ATHLETE PERFORMANCE**

Past studies have presented conflicting views of the relationship between athletics and student performance, military or civilian. Some research has shown that athletics are an important part of student development, regardless of academic cost (Pascarella, 1991). Others have decided that there is little significance of the impact of varsity athletics; rather success is attributed to only in the individual students' ability. Still others believe that the athletes playing for non-revenue sports (excluding football and basketball) acquire competitive academic quality point averages, as do non-athletes who do not formulate athletics in their everyday schedule. In the case of the United States Naval Academy, it has been shown that varsity athletics act as a contributor to fleet success (Leskovich, 2000). If that is the case, then a positive influence of varsity athletics on Midshipman performance should be expected.

The effects of varsity athletics on a student's life is felt most as a freshman. With that in mind, the significance of admission, varsity competition, and sports on freshman student-athlete's academic performance is great (Gurney & Stuart, 1987). A major concern of any new collegiate student-athlete is the combination of strict academic standards and the full time athletic commitment of varsity sports, noting the resultant unusual demands and responsibilities on freshmen student-athletes (Gurney & Stuart, 1987).

Research has concluded that the students who competed in their freshmen year held competitive GPAs to those who did not compete (Gurney & Stuart, 1987). In addition, there was no statistical significance in GPA with reference to semester of competition, cumulative GPAs, or the amount of credit hours passed. Freshmen who did not compete had only attempted one more hour than those who did, on average (Gurney & Stuart, 1987). The study also showed that non-competing freshmen were more likely to be in poor academic standing than competing freshmen.

Findings that suggested a negative relationship between competition and academic performance are non-existent, according to some research (Gurney & Stuart, 1987). It may be inferred that participation in varsity competition can be an incentive to improve academic performance amongst the students. Although specially admitted

students are more likely to compete, it may also be inferred that coaches may recruit student-athletes who are, in general, more responsible and attentive to academic demands, and more dependable in game situations (Gurney & Stuart, 1987).

The opinion that the term "student-athlete" should be reversed is well-known and often heard (Foltz, 1992):

The term student-athlete describes an individual whose education is combined with intercollegiate athletic participation. The sequence of the words, however, may not accurately reflect the respective emphasis placed on each in the student-athlete's life. At various university environments, athletics is the focal point and academics is a second priority. Often this emphasis is forced upon student athletes by overzealous coaches administrators, and supporters. This can be documented by numerous violations involving the altering of academic transcripts and the issuing of unearned credit (Foltz, 1992, p.10).

The stigma arises from the "dumb jock" label that is placed on many student-athletes.

Such statements are not completely founded (Pascarella, 1991). More significant are findings on the effects of athletics on reading comprehension, mathematics, and critical thinking in colleges and universities. Specifically, current research has sought to investigate the effects of athletics on cognitive abilities during freshman year in terms of: (1) revenue producing athletics, (2) men versus women, (3) race, and (4) institutional differences such as NCAA Division I versus non-Division I (Pascarella, 1991).

The findings of the research were significant. By the end of freshmen year, football and male basketball players were at a large disadvantage with respect to standardized reading and mathematics test batteries. In addition, there was a significant division between male non-athletes and male athletes in non-revenue sports with respect to reading and mathematics metrics (Pascarella, 1991). The disadvantage in critical thinking had also leaned towards students in revenue producing sports, but was not statistically significant (Pascarella, 1991). Such findings may foreshadow college career performance, with additional scholastic and social requirements (Pascarella, 1991).

Anyone in collegiate academia acknowledges the notion that "one cannot dismiss the often extensive time commitment required of intercollegiate football and basketball players, or the possible attendant development of a subculture that may not always value reading or study" (Pascarella, 1991, p. 12). In addition, football and male basketball players tend to take a larger portion of applied or professional classes during their freshmen year (Pascarella, 1991). The idea of sports as a "time sink" is notable, and may have significant effects on one's academic career.

Effects of athletics on specific abilities have been studied, and the research extends to the growth of character as well. The notion that sports becomes an all-encompassing "monster", devouring any dimension for personal growth is has been challenged in the past (Richards & Aries, 1999). The researcher acknowledges that:

time and energy are limited and that to conform fully in one role makes fulfillment of another role difficult. Role conflict between being an athlete and student is greatest among scholarship athletes in sports generating the highest revenues.

In addition, there are the social and leisure demands from large, revenue producing teams that impact a student's schedule (Richards & Aries, 1999). Variables in personal growth of the student-athlete include: (1) the time demanded by athletic teams versus other extracurricular activities, (2) the difficulties posed by membership on athletic teams, (3) the effects of athletic participation on academic success, and (4) the effects of athletic participation on well-being and growth (Richards & Aries, 1999).

Current research has noted several outcomes in this realm. First, athletes and non-athletes did not differ in the number of hours they spent in a typical week in class or studying. In addition, athletes devoted significantly more hours to extracurricular activities than did members of other extracurricular groups (Richards & Aries, 1999). Second, athletes perceived that they were not taken seriously by their professors (Richards & Aries, 1999). Third, comparisons of GPAs displayed no significant difference between athletes and non-athletes, regardless of lower SAT scores associated with athletes (Richards & Aries, 1999). Finally, athletes and non-athletes showed no significant differences in satisfaction with academic performance, extracurricular activities, or physical health (Richards & Aries, 1999).



Such findings challenge stereotypes of student-athletes, and the notion that intercollegiate varsity athletics are a detriment in the development of the college student. To their end, varsity athletes were able to overcome the "time sink" of athletics and multiple commitments. In addition, the study supported "an abundant approach to energy, which holds that people find time and energy for activities they are committed to (Richards & Aries, 1999)."

Grade Point Average (GPA) is a well-used method of determining performance as a student, and such a measure aids in answering the following questions: (1) What is the relationship between genders of student-athletes and mean cumulative GPA? (2) Is there an association between academic classifications of student-athletes and mean cumulative GPA? (3) Is there an association between types of sport participation of student-athletes and mean cumulative GPA (Foltz, 1992)?

Studying athletic effects in these terms produce mixed reviews of varsity athletics. In general, female athletes had higher GPAs than male athletes. In addition, students participating in non-revenue sports had higher GPAs than student-athletes in revenue sports (Foltz, 1992). These results delineate several factors. First, it maintains the critic's view that victory and revenue from varsity athletics corrupts higher learning; athletic performance is more important than their academic achievement (Foltz, 1992). Second, it maintains that revenue sports introduce students into university life, and they may be less academically ready than others. In a study completed by Becker, Wieberg, and Farrell, 10.6 percent of college football players were ineligible to compete as freshmen due to low high school and SAT/ACT scores (Foltz, 1992).

The effects of athletics on student performance at the United States Naval Academy have been studied to some degree. Some research has concentrated on the impact of club sports and varsity athletic sports programs on Midshipman academic and military performance. The research showed a positive relationship between sports participation and midshipmen performance, only in the realms of academic and military performance (Zettler, 2002). The study drew from the ideals of John Paul Jones as to the requirements of being a capable naval officer, in being a well-rounded individual; it takes more than just academics to become a "capable mariner" (Zettler, 2002). The study notes that Midshipman ranking or "order of merit" draws not only upon academics, but also on

military performance, physical fitness, participation on athletic teams, and conduct (Zettler, 2002).

Analysis was approached by three measures: (1) Academic Quality Point Ratio (AQPR), (2) Military Quality Point Ratio (MQPR), and (3) "lettering" in a sport, which measures participation (Zettler, 2002). The outcome of the study supported the hypothesis to some degree. MQPR was positively related to whether a Midshipman won a letter in either a varsity or club sport. In addition, AQPR was also positively related to whether a Midshipman won a letter in a varsity or club sport (Zettler, 2002). However, analysis of "graduates only" did not conclude any statistically significant relationship between athletics and Midshipman MQPR and AQPR (Zettler, 2002). The conclusions from the findings meant that "maturity, stamina, aggressiveness, [and] goal achievement...are learned on the athletic field are carried off the field and put to use in other venues" (Zettler, 2002), in particular, military performance.

The study of athletics into fleet performance provides further evidence with regard to the relationship of athletics on Midshipman performance (Leskovich 2000). Moreover, recent research has sought to investigate the importance of the varsity sports programs of the Academy, during a time when varsity athletics were being criticized by the media (Leskovich, 2002). The study outlined the variables that were significant in fleet performance and promotion, and then analyzed the overall effect of athletic achievement on promotion (2002).

The results of the analysis were significant in promotion to the rank of Lieutenant Commander (LCDR). Participation as a blue-chip team athlete increased the probability of promotion by 18.9 percent. Participation as a team athlete increased the probability by 11.4 percent. Participation as a varsity athlete increased probability by 7.7 percent (Leskovich, 2002)

By prior civilian and military research, the effects of varsity athletics on student performance are acknowledged; in addition, Leskovich (2002) remarks that future fleet performance has some relationship with athletic participation. By prior research as well, there is a recurring theme that athletes participating in non-revenue producing sports (excluding football and basketball) are competitive in the classroom to non-athletes. The entire Academy experience encompasses not only academic and military grades however.

Conduct grade is also a measure of a Midshipman's performance; the greater number of demerits you acquire, the worse the semester grade is. Unfortunately, honor violations are also a measure of a Midshipman's performance as well. Although there is no "honor grade" that work into the Midshipman's Order of Merit (OOM), honor violations work indirectly into the judging of that Midshipman by one's peers and officer chain of command.

The thesis seeks to find a relationship between athletics and the measures of ACQPR, MCQPR, conduct grade, and honor violation. Unlike past research, it will control for race, gender, SAT scores, major, and prior military experience first, evaluating each relationship. With those values controlled, the researcher will seek to assess the statistical significance of athletics itself

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### **III. DATA AND METHOD**

#### **A. DATA FIELD DESCRIPTION**

The database used in this study was compiled from the Institutional Research Office of the United States Naval Academy. Specifically, the Institutional Research Office provided demographic, admissions, athletic, and performance data for four years of the classes of 1999, 2000, and 2001. The resultant database provided for 3541 members admitted to these classes.

#### **B. VARIABLE DESCRIPTION**

As noted earlier, the study will determine the relationship between varsity athletics and Midshipman performance in two steps: (1) control for the effects of gender, race, SAT scores, major, and Prior Military Service, and (2) measure the incremental effects of varsity athletics on Midshipman Performance. A description of these two models will follow the description of each variable.

##### **1. Dependent Variables**

The dependent variables are considered as performance benchmarks for Midshipmen at the Naval Academy for several reasons. First, they are major requirements for graduation, with minimums for each. Second, they serve as benchmarks for excellence and evaluation for academic and military performance. Third, substandard performance with regard to each variable can mean separation from the Academy upon review from the Academic Board, and approval from the Commandant of Midshipmen, Superintendent, and Secretary of the Navy.

##### **a. Academic Quality Point Ratio (ACQPR)**

The first of the performance variables is an integral part of Midshipman life: academics. Midshipmen may have as many as 22 credit hours per semester depending upon major selection. Thus academics incur a considerable time investment from not only study, but also homework and lengthy research projects.

The consequences of an ACQPR below a 2.0 are steep. If a Midshipman's cumulative quality point ratio is below 2.0 at the completion of a semester, an academic probation is automatically imposed (USNAINST 1531.50A, 1998). A Midshipman will continue to be on probation after two semesters with a quality point ratio of 2.0, even if the cumulative quality point ratio is above 2.0 (USNAINST 1531.50A, 1998). Probation is only removed if at the end of the next semester the Midshipman has earned above a 2.0, not to include summer school (USNAINST 1531.50A, 1998). Any Midshipman found deficient at the end of an academic term will be discharged from the Academy, unless retained by the Academic Board. Deficiencies include: (1) failure to achieve a QPR of at least 1.5 for any semester or a QPR of at least 2.0 for any summer school whether attended voluntarily or not; (2) failure to remove probation at the end of the semester following that in which it was imposed; (3) failure in remedial courses (USNAINST 1531.50A, 1998).

For the purposes of the study, the variable ACQPR will be used in determining strength of academic performance. In keeping with the nature of the measure, a continuous variable will be utilized. Descriptives of the ACQPR follow, with missing values representing attrites from each class.

b. Military Quality Point Ratio (MCQPR)

The Midshipman Military Performance System (COMDTMIDNINST 1600.2A, 2001) delineates the requirements of Midshipmen to display aptitude for commissioning:

The Superintendant is charged by Title 10, U.S. Code 6962, with reporting to the Secretary of the Navy any Midshipman who possesses insufficient aptitude for commissioned service. Aptitude for commissioned service will be determined by evaluating demonstrated military performance and by considering all matters regarding suitability for commissioning using these procedures...(COMDTMIDNINST 1600.2A, 2001, p.1).

The Midshipman Military Performance System creates a set of measures by which: (1) military performance can be judged and (2) graduating criteria for

Midshipmen are set. The physical breakdown of the MCQPR is set forth according to weights of the following factors:

Physical Education 16.78%  
Athletic Performance 8.52%  
Military Performance 44.56%  
Conduct 19.66%  
Professional Courses 10.48%

Physical education grade is the semester grade acquired by Midshipman from the Physical Education course (swimming, boxing). Athletic performance is determined by the status of which a Midshipman is involved in athletics (i.e. Varsity Football Team Captain, Intramural Soccer Player). Military Performance grade is determined by the ranking of all classes per company, submitted by the Midshipman Company Commander and approved by the Company Officer. Professional course grade is the semester grade acquired by Midshipmen from Professional Programs, Leadership/Ethics/Law, and Seamanship and Navigation in Luce Hall; these courses include Weapons and Tactics, Navigation, and Naval Leadership. Conduct grade will be discussed in the next section.

For the requirements of the study, the variable MCQPR will be used to determine strength of military performance of each Midshipman. Using a continuous variable, the descriptives are as follows, excluding attrites.

c. Conduct Grade

The Midshipman Administrative Conduct System (COMDTINST 1610.2, 2000) sets forth the requirements for Midshipmen to abide by as standards of conduct. Each Midshipman receives a Conduct grade at the end of every semester, depending on the number of demerits that Midshipman accrues according to the number and seriousness of conduct violations. The graduation requirements are as such:

First Class midshipmen who have at least a 2.0 conduct average are eligible to graduate with their class, assuming they meet all other graduation requirements...

First Class midshipmen may not be allowed to graduate with their class if:

(1) They are suspected of an offense under the Conduct System, the Uniform Code of Military Justice, or federal, state or local law; or

- (2) They are the subject of pending conduct or honor processing; or
- (3) They are Unsatisfactory in Conduct; or
- (4) They have unserved restriction as of graduation day.

**Only the Superintendent, however, may authorize late graduation (COMDTINST 1610.2, 2000, p.25).**

It is clear that the grade required for graduation carries much influence in the life of Midshipmen. In Table 1, the physical breakdown of a Midshipman's conduct grade is determined by number of demerits acquired during the semester and by their class (first, second, etc):

Table 1. Conduct Grade and Demerit Scales

LETTER GRADE	POINT VALUE	1/C	2/C	3/C	4/C
A	4	0-25	0-25	0-30	0-35
B	3	26-45	26-45	31-49	36-60
C	2	46-60	46-60	50-70	61-80
D	1	61-70	61-70	71-80	81-90
F	0	70>	70>	80>	90>

The greater number of demerits that a Midshipman acquires lowers his or her conduct grade by these increments. In addition, these demerits are cumulative over the course of a Midshipman's career. The instruction defines this cumulative effect:

Table 2. Career Demerit Scale

CLASS	YEARLY DEFICIENCY ALLOWANCE	(2/3 YDA) DEMERIT LEVEL	CAREER ALLOWANCE
1/C	140	95	335
2/C	140	95	315
3/C	160	110	270
4/C	180	125	180



These allowances are very strict in the accrument of demerits and conduct violations. Midshipmen exceeding the allowances mentioned in Table 2 are placed into an "Unsatisfactory" classification, placing their graduation (late or otherwise) in limbo.

The variable CONDUCT will be used to determine strength of Midshipman conduct performance. The variable has a continuous nature, with descriptives to follow later in the chapter.

d. Honor Violation

Honor violation is an important performance measure for two major reasons. First, the focus on honor in a Midshipman's life is large. Training on the Midshipman Honor Concept (USNAINST 1610.3F, 2001) is given monthly by Company and Battalion Honor representatives. Each Midshipman is issued a card with the Treatise of the Honor Concept, to be kept with them at all times. During Plebe Summer, the indoctrination process stresses the importance of honor as part of an officer's character. Second, an honor violation is a major strike against a Midshipman's record, and may be the quickest route to separation. With some variation, a Midshipman may be separated from the Naval Academy in as little as 62 days (USNAINST 1610.3F, 2001), without any deliberation from the Academic Board. In addition, there may be collateral degradations in other areas, such as a Midshipman's fitness report, and rapport with subordinates, peers, and professors. If a Midshipman is placed on Honor remediation, that Midshipman may spend extra hours during the week on reading and writing on required remediation topics.

For the requirements of the study, the variable HONOR will be used to denote the presence of an honor violation within a Midshipman's career. Based on preliminary analysis of the distribution of honor violations (i.e., few midshipman had more than one honor violation), a dichotomous variable was constructed indicating the presence or absence of one or more violation.

## 2. Primary Variables

### a. Varsity Athlete

Varsity athletics, the focus of the study, is the predominant variable. As mentioned in the literature, athletics continue to show some effect on student performance. Due to the influence of athletics in Midshipman life, the researcher expects to see some measure of this effect. The measure will be treated as a dichotomous variable, categorizing into varsity athletes and non-varsity athletes.

## 3. Control Variables

### A. Race

The Brigade of Midshipmen is a microcosm of different ethnicities, which provides a reflective diversity in our Navy and Marine Corps. Diversity and related performance is a topic of much discussion, and clearly must be accounted for in this study. Past research has shown that minorities come into the collegiate environment less prepared than their Caucasian brethren. Due to the significance of this fact, the study must control for race, as well as gender.

### B. Gender

The Brigade of Midshipmen is made up of approximately 16 percent female Midshipmen every year, which is normative to Navy-wide officer population. With such large percentages, the study must first control for gender prior any further analysis of varsity athletics. In addition, it is important to note that there are separate physical standards at USNA for women than there are for men noted in Appendix A. These scores influence Physical Education grade, which also influences MCQPR, to be discussed later.

### C. SAT Scores

SAT scores are an important variable in the screening process for candidates for the Naval Academy. It represents a measure of cognitive ability in math and English required for success as a Midshipman. It is also factored into the Whole Person Multiple by the Admissions board in selection of candidates. The variables for SAT scores will be evaluated as a continuous measure, separating scores for both verbal and math.

### D. Prior Military Service

Military experience adds a definitive advantage to any Midshipman. Uniform regulations and standards of conduct are familiar with a "Mustang" Midshipmen, or Mids who were enlisted prior to their entrance to the Naval Academy. An extra measure of work ethic is almost expected, as is performance. Commanding officers send recommendations on these Midshipmen, expecting them to perform well in a rigorous environment.

With these expectations, the researcher may see a greater probability for success for these Midshipmen, especially in the realm of MCQPR, which encompasses professional courses and military performance. For these reasons, the researcher has factored in this variable into the performance study. Prior military service will be evaluated as a binary measure, noting Midshipmen as "with" or "without" prior military service.

### E. Major

The academic major that a Midshipman participates in is based of the strengths of one's cognitive ability. A Midshipman may be weak in mathematics, but extremely strong in writing skills. At USNA however, the spread of cognitive abilities is skewed towards math and science, due to the nature of the curriculum; all graduates leave with a Bachelor of Science, regardless of major.

For the purposes of this study, all majors are categorized into the three major groups: Engineering, Hard Sciences, and Humanities. The analysis will consider Engineering as the "hold-out" group, considering the core curriculum of the Academy

and its general focus towards engineering courses in all majors. Hard Sciences and Humanities will be dummy-coded accordingly.

#### 4. Model Development

The purpose of this thesis is to determine a relationship between varsity athletics and Midshipmen performance. The method however, must rule out several key factors that may influence performance and confound the observed relationship between athletics and performance. The analysis will control for these factors, as noted earlier, by first assessing the intercorrelations among the variables.

Given the potential confounds of race, gender, SAT scores, major, and prior military service, hierarchical regression is used to determine the existence and subsequent strength of the effect of varsity athletics on Midshipman performance after controlling for these factors. The following table presents specific descriptives of both dependent and independent variables.

Table 3. Variable Descriptives

Variable Description	Variable Name	Variable Type	Coding
Ethnicity:	MINORITY	Binary	0 = Caucasian 1 = All others
Gender	GENDER	Binary	0=male 1= female
SAT	SAT- V SAT-M	Continuous Continuous	200-800 200-800
Prior Military Experience	PRIOR	Binary	0 = Non-prior 1 = Prior Enlisted
Group 2	HARD SCIENCES	Binary	0 = Group 1 1 = Group 2
Group 3	HUMANITIES	Binary	0 = Group 1 1 = Group 3
Varsity Athlete	VARSITY	Binary	0 = Non-Varsity Athlete 1 = Varsity Athlete
Academic CQPR	ACQPR	Continuous	0.0 – 4.0
Military CQPR	MCQPR	Continuous	0.0 – 4.0
Conduct Grade	GRADE	Continuous	A – F recoded to 5 - 1
Honor Violation	HONOR	Binary	0 = Non-violation 1 = Violation

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## **IV. RESULTS**

### **A. INTRODUCTION**

The purpose of these analyses is examine the effects of varsity athletics on various Naval Academy outcome measures while controlling for the statistical effects of SAT scores, gender, ethnicity, prior enlisted service, and major. This chapter provides the descriptive statistics for each of the independent and dependent variables, and then presents the results of the linear regressions. More specifically, the results of the hierarchical regressions are presented with the control variables added as a set first, followed by varsity athletics for each of the four aspects of Midshipman performance.

### **B. DESCRIPTIVE STATISTICS**

This section contains the variable frequencies for each variable used in the regressions. Prior analysis began with a cross-tabulation of all variables included in the study. This table is found in Appendix A. In general, the cross-tabulation supported the inclusion of all variables in the study, finding each statistically related to Midshipman performance.

Table 4 provides the descriptive statistics and percentages of the sample for each control variable used in the regressions.

Table 4. Descriptive Statistics on Independent and Dependent Variables for Sample of USNA Classes of 1999 – 2001

Control Variables	Number (%)	N	Mean	Std Dev
<i>Gender</i>				
Male	2934 (82.9)	3538	0.829	0.376
Female	604 (17.1)	3538	0.16	0.396
<i>Ethnicity</i>				
Caucasian	2848 (80.5)	3538	0.805	0.396
Minority	690 (19.5)	3538	0.195	0.396
<i>Major</i>				
Engineering	1038 (29.3)	3538	0.293	0.455
Hard Sciences	721 (20.4)	3538	0.203	0.403
Humanities	1243 (35.1)	3538	0.351	0.478
<i>Prior Enlisted Service</i>	362 (10.2)	3538	0.088	0.283
<i>SAT - Math Range</i>	430 – 800	3538	657.1	61.074
<i>SAT - Verbal Range</i>	360 - 800	3538	632.6	66.43
<b>Independent Variable</b>	<b>Number (%)</b>	<b>N</b>	<b>Mean</b>	<b>Std Dev</b>
<i>Varsity Athlete</i>	1492 (42.2)	3538	.4217	.4939
<b>Dependent Variables</b>	<b>MIN/MAX</b>	<b>N</b>	<b>Mean</b>	<b>Std Dev</b>
<i>ACQPR</i>	.38 - 4.00	3200	2.85	0.556
<i>MCQPR</i>	.6 - 4.00	3241	3.04	0.428
<i>CONDUCT</i>	0.0 - 5.00	2043	4.96	0.209
<i>HONOR VIOLATION</i>	0 - 1	3237	0.059	0.236

NOTE: Shading indicates that the variable was dropped from the analysis because of measurement deficiencies.

Upon consideration of each variable's descriptive statistics, three variables (one control and two dependent variables) were precluded from further consideration: Prior Enlisted Service, Conduct Grade, and Honor Violation. The variability of each predictor was highly skewed in each case. In fact, in the case of conduct and honor violation, the overwhelming majority of cases fell into one category, leaving practically nothing to predict. The variable "Conduct Grade" was recoded to include only "A's" and "B's", but

upon analysis, the variance was still skewed towards higher grades. Figure 1 through 3 provides statistical evidence of these facts.

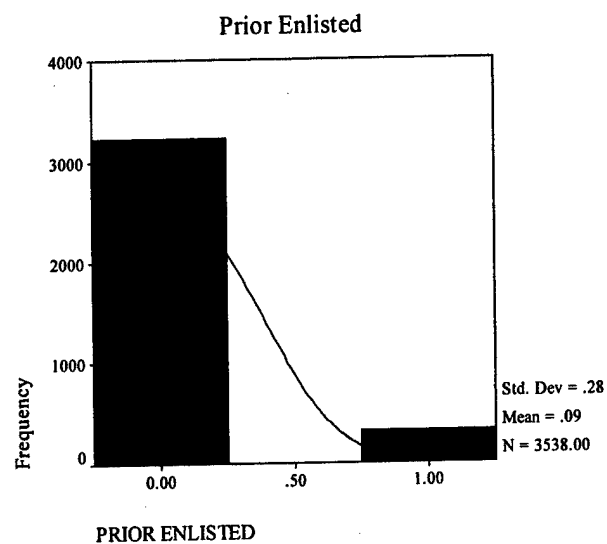


Figure 1. Prior Enlisted Service of USNA Classes of 1999-2001

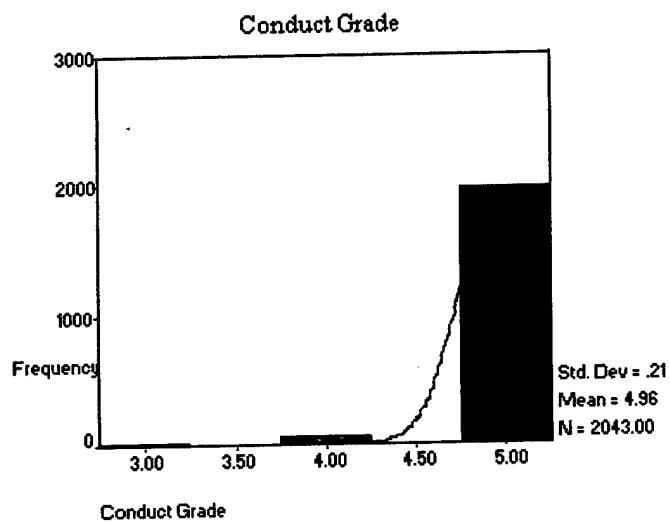


Figure 2. Conduct Grade of USNA Classes of 1999-2001



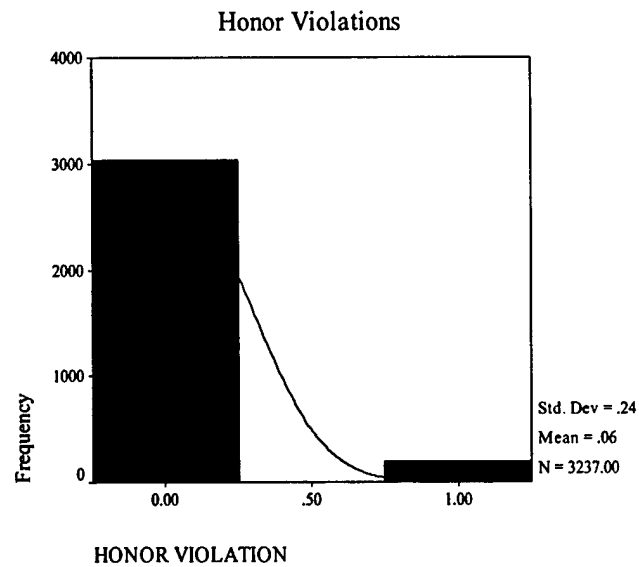


Figure 3. Honor Violations of USNA Classes of 1999-2001

### C. ACQPR

In Table 5, the results of both steps of regression are displayed, first with the control variables alone, and then with control variables plus Varsity Athlete. In the first step, five of the six variables proved to be statistically significant with respect to ACQPR. Of those five, SAT Math and SAT Verbal scores had the greatest strength in contributing to ACQPR. In the second step, five of seven variables are found to be significant, with SAT scores remaining greatest in strength. Varsity Athlete, however, was not shown to be statistically significant.

Table 5. Hierarchical Linear Regression of Varsity Athletics on ACQPR, Controlling for Demographics and Other Factors

Step 1	B	Std. Error	Beta	T	Sig.
Minority	-0.154	0.023	-0.110	-6.685	0.000
Humanities	0.067	0.021	0.058	3.206	0.001
Hard Science	0.090	0.023	0.067	3.829	0.000
GENDER_R	-0.005	0.023	-0.003	-0.216	0.829
SAT-Math	0.003	0.000	0.337	18.011	0.000
SAT-Verbal	0.001	0.000	0.139	7.748	0.000
R	0.453	R <sup>2</sup>	0.205		
Step 2	B	Std. Error	Beta	T	Sig.
Minority	-0.155	0.023	-0.110	-6.689	0.000
Humanities	0.067	0.021	0.059	3.214	0.001
Hard Science	0.090	0.023	0.068	3.833	0.000
GENDER_R	-0.005	0.023	-0.003	-0.216	0.829
SAT-Math	0.003	0.000	0.336	17.907	0.000
SAT-Verbal	0.001	0.000	0.139	7.677	0.000
Varsity Athlete	-0.005	0.018	-0.005	-0.281	0.779
R	0.453	R <sup>2</sup>	0.205		

#### D. MCQPR

In Table 6, the same steps are taken for analysis in MCQPR. Three of six variables, Minority, SAT-M, and SAT-V scores were found to be significant. SAT scores again were the strongest predictors of the three of the three. In the second step, the beta weight for SAT scores increased in strength, while the beta for Minority lost declined. Again, Varsity Athlete was not shown to be statistically significant.

Table 6. Hierarchical Linear Regression of Varsity Athletics on MCQPR, Controlling for Demographics and Other Factors

Step 1	B	Std. Error	Beta	t	Sig.
Minority	-0.175	0.019	-0.162	-9.238	0.000
Humanities	0.004	0.017	0.005	0.241	0.810
Hard Science	0.029	0.019	0.028	1.491	0.136
GENDER_R	-0.024	0.019	-0.021	-1.260	0.208
SAT-Math	0.001	0.000	0.167	8.393	0.000
SAT-Verbal	0.000	0.000	0.058	3.035	0.002
R	0.290	R <sup>2</sup>	0.084		
Step 2	B	Std. Error	Beta	t	Sig.
Minority	-0.173	0.019	-0.160	-9.105	0.000
Humanities	0.003	0.017	0.003	0.149	0.882
Hard Science	0.028	0.019	0.027	1.444	0.149
GENDER_R	-0.024	0.019	-0.021	-1.254	0.210
SAT-Math	0.001	0.000	0.171	8.532	0.000
SAT-Verbal	0.000	0.000	0.062	3.212	0.001
Varsity Athlete	0.028	0.015	0.032	1.887	0.059
R	0.292	R <sup>2</sup>	0.085		

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## **V. CONCLUSIONS AND RECOMMENDATIONS**

### **A. CONCLUSIONS**

As noted in the preceding chapter, Varsity Athlete Status was not a statistically significant predictor of measured aspect of Midshipman Performance. SAT-Math and SAT-Verbal, as expected were the best predictors of Midshipman Performance. As the research has shown, Varsity Athletics has some effect, sometimes positive or negative, on student performance. Athletics in general are pervasive in Midshipman life, whether it be playing an intramural game of soccer or running a Physical Readiness Test. Athletics even plays directly into MCQPR as a weighted percentage into final MCQPR score. The fact that Varsity Athletics was not shown to be statistically significant was unsettling, but not surprising, in the context of this data set.

In the light of student admission requirements for USNA, this non-significance may not be surprising. Unlike civilian institutions, each candidate must show some measure of athletic ability during an initial Physical Fitness Assessment. Being a high-school varsity athlete is a highly-encouraged activity prior to entry to USNA. Each plebe is expected to perform one's Physical Readiness Test to a standard which is exceptionally higher than Navy Fleet standards. The bottom line is that USNA accepts not only academically sound but physically sound candidates, and therefore does not have as wide a distribution of athletes as seen in a civilian institution. Because of restriction in range, the effects of Varsity Athletics may not be readily seen. As noted in our deleted variables, Midshipmen occupy the top end of many of these abilities.

Another reason for the lack of significance may stem from the current measures themselves. The available measure used to evaluate the effects of varsity athletics may not be appropriate. A better, less deficient measure is needed in order to surmise this aspect of success as a Midshipman.

Some variables were not considered in this study due to the time and scope of the study. First, the variable of club versus varsity sport was not included, however the "time sink" in a varsity sport is much higher than a club sport. Second, the time of sport or

“in-season” sports was not analyzed due to the focus of the study, which was year-round for each. The time sink for an athlete off-season is lessened greatly

## **B. ADMINISTRATIVE RECOMMENDATIONS**

Foremost, a better measure of participation in athletics and Varsity Athletics in particular is required. Several deficiencies are inherent in the current measures. First, the amount of time for practice and match for each sport, including intramural, club, and varsity, has not yet been determined. This may be accomplished through a survey of each sport team. Second, some sports are seasonal in nature, and some are not, such as track and sailing. This confounds a measure of participation from semester to semester. Third, football players are normally required to attend Summer School, which may render their academic performance uncomparable to other athletes.

In addition, the criterion or criteria used to assess the effects of athletics deserve careful consideration. There are many aspects of performance. It is important to measure participation in athletics against outcomes that such participation is designed to address directly.

These issues may be addressed through a survey of Midshipman, to include the amount of time allotted for practice and play, additional academic requirements, the number of sports played by each Midshipman during each Academic year, and their position of each team. Further, outcomes may include perceptions of cohesion, self-confidence, etc. Better predictors and criteria together are needed to assess the contributions of athletic participation to the USNA experience.

## **C. RECOMMENDATIONS FOR FURTHER RESEARCH**

Because of the population size of the study, several variables were considered but not included. The following areas of interest are recommended for further study:

1. **The “time sink” of varsity sports vs. Midshipman performance:**  
Using surveys across the student body and historical data, a study of time allotted for each sport (varsity, club, intramural) can be measured against Midshipman performance. This study may be helpful in the scheduling of Brigade-wide events or even sports period and practice.

2. **Seasonal sports vs Midshipman performance:** The current study does not take into account any shift of performance accompanied with a sport's season. This study may provide some insight into specific trends of Midshipmen when in and out of season for their particular sport. Results may give staff and faculty a thumbnail-sketch of potential drops in performance with Midshipmen associated with certain sports.
3. **Seasonal sports vs Academic Major Selection:** A study of sports participation, selection of major, and performance in major may merit research as well. Such a study may dispel the myth of the "dumb jock", and offer guidance in Midshipman placement into the Majors program. The study may also aid in general class scheduling to optimize both athletic and academic performance.
4. **Revenue Sports vs Non-revenue Sports in Fleet Performance:** A study of these groups in fleet performance may give individual programs a benchmark in their player's development. The likeliness of a football player ascending higher than a crew member could be determined, for example.

# APPENDIX A

		Conduct	Honor	ACQPR	MCQPR	Minority	Gender	Prior Enlisted	SAT-Math	SAT-Verbal	VARSIITY
Conduct	Pearson	1.000	0.000	0.267	0.421	0.100	0.131	0.098	0.012	-0.027	0.006
	Sig. (2-tailed)		0.997	0.000	0.000	0.000	0.000	0.000	0.463	0.113	0.738
	N	3538.000	3237.000	3200.000	3241.000	3538.000	3538.000	3538.000	3538.000	3538.000	3234.000
Honor	Pearson	0.000	1.000	-0.014	-0.023	0.079	-0.028	0.064	0.019	-0.024	0.027
	Sig. (2-tailed)	0.997		0.422	0.195	0.000	0.111	0.000	0.281	0.165	0.126
	N	3237.000	3237.000	3196.000	3237.000	3237.000	3237.000	3237.000	3237.000	3237.000	3234.000
ACQPR	Pearson	0.267	-0.014	1.000	0.767	-0.018	-0.010	-0.012	0.412	0.311	0.002
	Sig. (2-tailed)	0.000	0.422		0.000	0.316	0.565	0.493	0.000	0.000	0.927
	N	3200.000	3196.000	3200.000	3200.000	3200.000	3200.000	3200.000	3200.000	3200.000	3193.000
MCQPR	Pearson	0.421	-0.023	0.767	1.000	0.004	-0.024	-0.003	0.233	0.168	0.003
	Sig. (2-tailed)	0.000	0.195	0.000		0.802	0.179	0.869	0.000	0.000	0.871
	N	3241.000	3237.000	3200.000	3241.000	3241.000	3241.000	3241.000	3241.000	3241.000	3234.000
Minority	Pearson	0.100	0.079	-0.018	0.004	1.000	0.022	0.091	-0.029	-0.009	-0.004
	Sig. (2-tailed)	0.000	0.000	0.316	0.802		0.192	0.000	0.081	0.604	0.841
	N	3538.000	3237.000	3200.000	3241.000	3538.000	3538.000	3538.000	3538.000	3538.000	3234.000
Gender	Pearson	0.131	-0.028	-0.010	-0.024	0.022	1.000	-0.052	-0.016	-0.007	0.067
	Sig. (2-tailed)	0.000	0.111	0.565	0.179	0.192		0.002	0.341	0.672	0.000
	N	3538.000	3237.000	3200.000	3241.000	3538.000	3538.000	3538.000	3538.000	3538.000	3234.000
Prior Enlisted	Pearson	0.098	0.064	-0.012	-0.003	0.091	-0.052	1.000	-0.008	-0.008	-0.012
	Sig. (2-tailed)	0.000	0.000	0.493	0.869	0.000	0.002		0.631	0.618	0.497
	N	3538.000	3237.000	3200.000	3241.000	3538.000	3538.000	3538.000	3538.000	3538.000	3234.000
SAT-Math	Pearson	0.012	0.019	0.412	0.233	-0.029	-0.016	-0.008	1.000	0.444	-0.006
	Sig. (2-tailed)	0.463	0.281	0.000	0.000	0.081	0.341	0.631		0.000	0.744
	N	3538.000	3237.000	3200.000	3241.000	3538.000	3538.000	3538.000	3538.000	3538.000	3234.000
SAT-Verbal	Pearson	-0.027	-0.024	0.311	0.168	-0.009	-0.007	-0.008	0.444	1.000	-0.020
	Sig. (2-tailed)	0.113	0.165	0.000	0.000	0.604	0.672	0.618	0.000		0.264
	N	3538.000	3237.000	3200.000	3241.000	3538.000	3538.000	3538.000	3538.000	3538.000	3234.000
VARSIITY	Pearson	0.006	0.027	0.002	0.003	-0.004	0.067	-0.012	-0.006	-0.020	1.000
	Sig. (2-tailed)	0.738	0.126	0.927	0.871	0.841	0.000	0.497	0.744	0.264	
	N	3234.000	3234.000	3193.000	3234.000	3234.000	3234.000	3234.000	3234.000	3234.000	3234.000



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